



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
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NEW YORK, NY 10007-1866

JAN 19 2018

Lawrence McShea, P.E.
Project Manager
Arconic Remediation
Arconic Technical Center
New Kensington, PA 15069-0001

Re.: Arconic, Inc. Massena, New York Facility, EPA I.D. No. NYD002232304 (formerly Alcoa, Inc.) Secure Landfill Cell 3 Expansion

Dear Mr. McShea:

The Environmental Protection Agency (EPA) Region 2 has reviewed Arconic's draft Certification Report and the 2017 Operations Summary for the Secure Landfill Cell 3 expansion project. These documents were transmitted electronically on November 30, 2017.

Please find enclosed EPA's comments prepared during review of these documents. We request that Arconic provide a response to these comments by March 5, 2018.

If you have any questions, please contact me at (212) 637-4109 or via email at everett.adolph@epa.gov, or Nidal Azzam, Chief of our Base Program Management Section, at (212) 637-3748 or via email at azzam.nidal@epa.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "Adolph S. Everett", is positioned above the printed name and title.

Adolph S. Everett
Chief, Hazardous Waste Programs Branch

Enclosures

cc (w/encls.): Peter R. Taylor, New York State Department of Environmental Conservation
Region 6 Headquarters

**TECHNICAL REVIEW
DRAFT FINAL CERTIFICATION REPORT FOR
EXPANSION OF CELL 3 OF THE SECURE LANDFILL
JANUARY 2018**

ARCONIC INC., MASSENA, NEW YORK

Booz Allen Hamilton, Inc. (Booz Allen) has completed a technical review of the November 2017 Draft Final Certification Report for Expansion of Cell 3 of the Secure Landfill at the Arconic, Inc. (Arconic) facility in Massena, New York. This report documents efforts implemented by Arconic to increase capacity of Cell 3 by raising the height of the eastern berm of the existing cell. EPA approved plans for this work in a letter to the facility dated August 25, 2017. This submittal was reviewed for compliance with the Construction Work Plan (CWP) and the Construction Quality Assurance Plan (CQAP), both dated July 2017. Comments developed during the review of expansion certification are provided below.

COMMENTS ON THE DRAFT FINAL CERTIFICATION REPORT

Table 1-2. Problem Identification and Correction Reports (PICRs)

1. The title of PICR #009 in this table refers to grid cells A13 and A14, but the figure provided with the PICR in Appendix C refers to grid cells A14 (text description) and B13 (highlighted legend). Similarly, the title of PICR #010 in Table 1-2 refers to grid cell B13, but the description refers to grid cell A14. The attached figure provides no clarity either, because it is the same figure that was provided with PICR #009. These inconsistencies result in confusion as to where the liner damage actually occurred. Revise the table accordingly and ensure that the PICR figures are appropriate.

Section 2.1.4. Air Monitoring Programs

2. Figure 2-1 from Appendix E shows the location of air monitoring station SLF Air 2 as being approximately 1,000 feet southeast of Cell 3. As also shown in Appendix E, the prevailing wind direction in this area is west-east. Revise this section to document the actual location of the SLF Air 2 monitor. Furthermore, this discussion should be expanded to consider the need to establish another air monitoring location directly downwind of the cell (east of the unit between existing air monitoring stations 2 and 3).
3. At the top of page 2-4, Arconic indicates that the air monitoring program continued through November 17, 2017. Page 5 of the 2017 Operations Memorandum for Cell 3 confirms that this was the date on which application of the temporary Posi-Shell winter cover was completed. However, Appendix E provides air monitoring data only through November 13 (for particulates and volatile organic compounds [VOCs]) and November 9 (for

polychlorinated biphenyls [PCBs]). Air monitoring should not have been discontinued while waste materials were still exposed at the landfill surface and subject to dispersion. Explain why air monitoring was halted prematurely, or provide data for the remaining days of landfill waste cover placement.

Section 2.1.5, Site Preparation

4. Drawing B-203351 shows the location of the decontamination pad for heavy equipment at the southwest corner of Cell 3. However, the drawing does not specify the location of the temporary shed for worker decontamination. Clarify the location of both features on the referenced drawing.
5. The discussion at the bottom of page 2-4 indicates that a new 10-foot wide access road was constructed from the existing southern access road to the Cell 3 expansion berm ramp. The composition of this access road is reportedly non-woven geotextile and six inches of crushed stone. Furthermore, no discussion of the pedestrian walkway is provided. A review of drawing B-203351 and Note 3 indicates that the access road described above is 20 feet wide and constructed of non-woven geotextile and 12 inches of common fill. Note 2 on the drawing indicates that the pedestrian walkway is roughly 10 feet wide and constructed of non-woven geotextile and eight inches of crushed stone. None of the newly constructed roads or walkways was constructed of six inches of crushed stone. Revise the text to resolve these inconsistencies, and fully cover the scope of newly constructed access features.
6. The fourth paragraph on page 2-5 should be corrected to refer to the standard wipe samples size of 100 square centimeters. This same correction should be made in the last two paragraphs of Section 2.1.6.
7. The discussion regarding removal of the interim Cell 3 cover and drainage sand should be expanded to document removal of the two gas vents, and indicate whether these components were cut up and disposed in Cell 3, or decontaminated and stockpiled for future use with the final cover.

Section 2.1.6, Temporary Separation Berm

8. The first paragraph in this section refers to an email from the New York State Department of Environmental Conservation (NYSDEC) approving Tetra Tech's alternative design for the temporary separation berm. This email should be provided in Appendix A to fully document approval of the implemented design.

Section 3.2.1, Testing of Offsite Borrow Sources

9. This section notes that, after testing for particle size and Modified Proctor Compaction, it was determined that “the fines content of the staging area fill materials [ranging from 98 to 59 percent] was greater than the maximum fines content of 48 percent allowed according to the material specification requirements [in Specification 02200]”. Nevertheless, the Engineer of Record determined that “the material can be adequately compacted to achieve design intents under the required compactive effort and moisture contents.” No justification for this decision was provided, and it is unclear whether this judgement applied to all fill materials from the central haul road, the east stockpile, and Location #6.

Table 3-1 shows in-place compaction levels for each lift of common fill placed as part of the expansion project. There were a few insufficiently compacted locations while using the Curran Common Fill (CCF), each of which was recompacted and retested before proceeding with additional lift placement. Compaction failures were also noted during construction of Lift 12 with fill from the central haul road, but these were able to be fixed through recompaction efforts. Compaction values reported for Lift 14, constructed of material from the east stockpile, were found to be acceptable. However, repeated compaction failures were reported during construction of Lift 15 with material from Location #6. In most cases, the required compaction level of 92% could not be achieved with this fill material even after repeated efforts to do so. The source of fill used for most of Lift 13 is not specified in Table 3-1, but the table does note that that lift needed reworking and failed to meet acceptable compaction levels after such activity. Thus, it appears that the fill materials, at least those from Location #6, were indeed unacceptable for use in landfill foundations and subgrades, as per the approved specification. It is important to note that Table 3-1 shows unique maximum dry density (MDD) and optimum moisture values for the central haul road, the east stockpile, and Location #6 – indicating that these materials were placed in lifts without prior homogenization in the staging area.

Instead of removing the unacceptable fill materials and immediately reverting to use of the CCF (which had been used successfully for the first 11 lifts and would later be used successfully for the last two lifts and the northern slope), MDD values for each type of staged fill material (shown in Table 3-1 as 103.0, 108.5, and 118.0 pounds per cubic foot [pcf]) were averaged and then rounded to 110.0 pcf. The resulting average was then compared with measured density in the field to determine compaction. However, unless *equal volumes* of each type of stage fill were used, a weighted average would be more reflective of homogenized material properties than a direct average. Moreover, unless the various types of fill were homogenized in the staging area *prior to placement in lifts*, the averaged MDD would not be appropriate as it would understate the maximum possible density of the Location #6 materials (resulting in inadequately compacted fill) and overstate that of the central haul and east stockpile materials. “Acceptable” compaction

levels on page 4 of Table 3-1 do not reflect the actual properties of soil placed in Lifts 13, 14, or 15.

Minimum compaction levels are specified to ensure that the placed soil will be adequate to prevent shear and settling when subject to loading. Thus, failure to meet the required minimum compaction level of 92% under actual installed field conditions may affect acceptable loading limits on the affected lifts. Because it is impractical to remove installed landfill liner components to address issues with the underlying foundation, an engineering evaluation must be conducted to assess the potential for liner failure under current conditions and any resulting impacts on landfill capacity.

10. There are numerous inconsistencies between this section, Table 3-1, and Table 3-2 regarding MDD and optimum moisture content values of staging area fill material.
 - The last sentence in this section states that it ranged from 103-110 pcf. However, Tables 3-1 and 3-2 specify ranges of 103-118 pcf and 103-123.1 pcf, respectively.
 - The first three rows on page 3 of Table 3-1 appear to erroneously list MDD and optimum moisture values for central haul road fill, rather than those for east stockpile fill.
 - There is no explanation as to how the MDD and optimum moisture content values shown on page 5 of Table 3-1 were derived for use in evaluating measurements collected on August 16, 2017 (115.2 pcf and 16.2%, respectively). These numbers do not match those shown on Table 3-2 for Location #6 fill.
 - Whereas Table 3-2 lists the optimum moisture content of central haul road soils as 11.4%, Table 3-1 identifies this value as 21.4%.
 - Optimum moisture content values listed on the second half of page 4 of Table 3-1 have not been adjusted to reflect “homogenization” of the staged fill material.

Because MDD values are used in critical compaction calculations, and because specification set limits on acceptable moisture content, there must be clarity and consistency in these number. Correct the text and tables as appropriate, and ensure that all calculations used accurate values.

11. Define the acronym “DMCC” on page 2 of Table 3-1.

Section 4, Low Permeability Soil Liner

12. Figures 4-1 and 4-2, covering two components of the geosynthetic liner system, should be moved to Section 5 of the expansion Certification Report. Instead, this section should include the topographic survey map provided in Appendix I, which documents that the clay liner was installed to a full thickness of at least 36 inches at all surveyed locations.

Section 4.2.1, Investigation of Low Permeability Soil (Clay) Borrow Source

13. The first paragraph in this section lists the tests performed on samples of the gray glaciomarine clay obtained for construction of the low permeability soil liner. A comparison of these tests with those listed for pre-construction classification testing on Table 2-7 shows that the samples should also have been analyzed for organic content (ASTM D2974) and Atterberg limits (ASTM D4318). In addition, the Certification Report does not confirm that periodic testing of the imported clay (for comparison to pre-construction values and approved specifications) was conducted as outlined in Table 2-7 of the CQAP. Provide discussion in Section 4.3.7 to document and explain these deviations from the approved plan for evaluation of borrowed clay.
14. According to text at the top of page 4-2, analytical results show that the required hydraulic conductivity can be achieved with the gray clay at molding moisture contents of 23.0% or less. The MDD for the clay, as determined by the Modified Proctor compaction test was 16.2%. Section 2.01A of Specification 02201 indicates that molding moisture content should be within 3% above the optimum moisture content. This deviation from the specifications is not discussed in the Certification Report. Instead, the text indicates only that the Engineer approved the gray clay borrow material for liner construction. Section 2.2.2 of the Test Fill Construction Report in Appendix H states that the clay exhibited acceptable hydraulic conductivity at a moisture content of 23.1% and compaction to approximately 91% of the MDD. Based on plotted levels of dry density against water content on Figure 5-1, the report then concludes that moisture content at placement shall range between 16.2 and 23.5%. Thus, the test fill evaluation appears to support a deviation from the molding moisture content requirement in Specification 02201. These details should be provided in the text of Section 4.2.2 in the Certification Report. In addition, EPA and NYSDEC approval of the Test Fill Construction Report (and the noted deviation) should be documented in Appendix A of the Certification Report.

Section 4.3.1, Subgrade

15. Correct the fourth paragraph of this section to reference Drawing B-203357-JM, instead of Drawing B-203356-JM. This same correction should be made in the fifth paragraph on page 5-3.

Section 4.3.4, Moisture/Density

16. The first paragraph in this section states that areas where the clay liner did not achieve 90% compaction were recompacted and retested until an acceptable compaction level was achieved. However, Table 4-1 appears to show a few locations where the moisture content was out of acceptable range and/or the compaction level did not reach 90% -- and yet no retesting is documented. There are no acceptable results in the table for Lift 6 at locations

10 and 40. Provide additional data to show that Lift 6 placement was measured and confirmed to be acceptable in these locations.

Section 4.3, Post-Construction Activities

17. This section states that placement of the clay liner was completed on August 30, 2017. Punch list items regarding the clay liner were completed on September 8, 2017. Provide brief detail as to how the liner was protected in accordance with Table 2-5 of the CQAP until placement of the high-density polyethylene (HDPE) liner commenced on September 19, 2017.

Section 5.3.1.1, HDPE Geomembrane Installation

18. As stated on page 5-4, minimum peel strength for fusion welds at HDPE liner seams is 88 pounds per inch. However, Table 5-3 shows that peel strengths were only 81 pounds per inch in one of the samples from DS-4 and 79 pounds per inch in one of the samples from DS-5. Expand the text to discuss corrective actions implemented pursuant to Table 2-12, Item K. Impacts of these failures on the frequency of destructive seam testing (per Table 2-12, Item B) should also be discussed on the Certification Report.

Section 5.3.1.2, Geotextile Installation

19. Expand this section to confirm that, pursuant to Table 2-4 of the CQAP, geotextiles were not unwrapped more than one hour ahead of installation.

Section 5.5, Drainage Sand Installation

20. This section discusses placement of the drainage sand layer that will connect to the existing leachate collection system (LCS) within the landfill. Specific detail should be provided to confirm compliance with Section 4.15 of the CWP and Tables 2-4 and 2-6 of the CQAP (including requirements for periodic testing of the sand). Most importantly, the Certification Report must document steps undertaken to confirm that the sand layer has been properly tied into, and adequately drains to, the existing LCS that was installed in 2005.

Section 6.2, Toe Drain Installation

21. Expand this section to clarify that the trench was lined with a geocomposite clay liner, HDPE, *and* geotextile, as outlined in DCF #196. This section should also clarify whether earthen materials underlying, and common fill overlying, the toe drain was analyzed for soil properties as required by Table 2-6 of the CQAP.

22. Correct the first paragraph of this section to reference Drawings B-203358-JM and B-203359-JM, instead of Drawings B-203357-JM and B-203358-JM.

Section 7.2, Vegetated Topsoil

23. This section must be expanded to document compliance with required testing for the topsoil pursuant to Section 4.17 of the CWP and Table 2-6 from the CQAP.

TECHNICAL REVIEW
2017 OPERATIONS MEMORANDUM FOR SECURE LANDFILL CELL 3
JANUARY 2018

ARCONIC, INC., MASSENA, NEW YORK

Booz Allen Hamilton (Booz Allen) has completed a review of the November 27, 2017 memorandum detailing operation and maintenance (O&M) activities performed at existing Cell 3 of the Secure Landfill at the Arconic, Inc. (Arconic) facility in Massena, New York. This memorandum focuses only on continued landfilling of waste, and does not address activities associated with expansion of the landfill cell (including construction of the temporary separation berm between the active waste disposal area to the west and the expansion area to the east). The memorandum was reviewed for compliance with the Secure Landfill O&M Manual and the Work Plan (WP) for O&M, both dated July 2017. Comments developed during the review of the O&M memorandum are provided below. Where appropriate, the comments below reference the November 2017 Certification Report for the Cell 3 Expansion (Certification), which has also been reviewed, and on which comments have been provided to EPA under separate cover.

I. GENERAL COMMENT

1. Several preparatory components of work detailed in the O&M WP have not been addressed in the O&M memo. These items include:
 - Establishment of office facilities and associated utilities/services
 - Installation of signage to warn against unauthorized site access
 - Installation of a powered sliding gate and the Gate #6 entrance
Inspection and repair of the haul road between Building 120 and Cell 3
 - Removal/stockpiling of clean sand, which had been placed over Cell 3 waste as part of the interim cover
 - Removal and disposal or decontamination and storage of the two existing gas vents
 - Construction of a heavy equipment access ramp on the east side of Cell 3

Except for the last item (which was addressed in the Certification), each of these components of work is associated with ongoing waste disposal activity and maintenance of the landfill and, thus, should be thoroughly documented in the 2017 O&M memo. Revise the memo accordingly.

II. SPECIFIC COMMENTS

2017 Cell 3 Operations Activities

2. Both the O&M memo and the Certification discuss establishment of two separate entry points into Cell 3 – a heavy equipment decontamination pad at the southwest corner of Cell 3 and a worker decontamination area/shed at the southern end of Cell 3. However, Figure 4 from the O&M memo and Drawing B-203351-JM from the Certification show only one decontamination area. Revise the text, figures, and drawings to clarify the location of these entry points.
3. Unless details in the Certification are incorrect, text on page 2 should be revised for consistency with notes on Drawing B-203351-JM, which indicate that concrete jersey barriers were also used in construction of the heavy equipment decontamination pad.
4. The first sentence in the second bullet on this page should be extremely clear that the exclusion zone for ongoing waste disposal activity in 2017 was bounded by the top of previously installed, permanent Cell 3 berms to the north, south, and west, and by the *temporary construction berm* to the east.
5. Figure 2 shows the location of the four air monitoring stations used to assess air quality during Cell 3 activity. It is noted that none of the monitoring stations is situated directly downwind of the unit in the prevailing wind direction (west to east). To allow for more comprehensive air monitoring during future waste disposal within existing and expanded portions of Cell 3, it is recommended that another air monitoring location be installed east of Cell 3 between existing air monitoring stations 2 and 3. At minimum, portable air monitoring stations should routinely be placed in this location during active landfill operations.
6. The third bullet on page 2 states that the Cell 3 air monitoring program continued through November 17, 2017. Page 5 of the memo confirms that this was the date on which application of the temporary Posi-Shell winter cover was completed. However, Appendix A provides air monitoring data only through November 13 (for particulates and volatile organic compounds [VOCs]) and November 9 (for polychlorinated biphenyls [PCBs]). Air monitoring should not have been discontinued while waste materials were still exposed at the landfill surface and subject to dispersion. Explain why air monitoring was halted prematurely, or provide data for the remaining days of landfill waste cover placement.
7. The last paragraph on page 3 indicates that steel members contaminated with polychlorinated biphenyls (PCBs) from Building 120 were placed in the cell and bedded in two-foot lifts with existing Grasse River sediments. Section 4.9.8 of the O&M WP indicated that the steel will be placed in 18-inch lifts with a 12-inch cover layer. No

explanation has been provided for this deviation from the approved plans, and no mention is made in the O&M memo of additional waste cover for the steel. Accordingly, it is unclear whether the steel waste placed in one-foot lifts overlain by one foot of cover material (which would increase the overall ratio of waste to buffering material), or if the steel was placed in two-foot lifts (which, with or without the 12-inch cover, would decrease the ratio of waste to buffer). Given that the steel occupies a significantly higher volume of landfill space than was anticipated, it is possible that the change was an attempt to preserve remaining landfill capacity. However, this deviation should be fully explained in the O&M memo, along with an evaluation of any potential negative impacts on the unit (including the underlying liner system). Efforts implemented to counteract these potential impacts should also be documented in the O&M memo.

8. The first full paragraph on page 4 states that a clean road was established from the Cell 3 southern access ramp to grid location D6. However, Figure 4 shows that this access ramp extends to grid locations C4 and D4. Figure 6 suggests that the constructed road extends northward into grid locations B4, C5, and D5. Clarify the actual extent of this access road into the southern end of Cell 3.
9. The last full paragraph on page 4 discusses pressure washing and liner wipe sampling prior to construction of the temporary separation berm. The text also discusses repeat wipe sampling (samples 13B and 14B) after flooding compromised the temporary separation berm on August 14, 2017. For completeness, this paragraph should also document liner cleaning and wipe sampling conducted after waste was inadvertently released into the northern section on July 29, 2017.
10. The last sentence on page 4 refers to disposal of PCB-impacted concrete from Building 120 in the landfill. Table 4 (pages 24 and 25) of the memo indicates that contaminated concrete from Buildings 120 and 123 were disposed in grid locations E8 and F8. However, Table 4-1 from the O&M WP only identified contaminated concrete from Building 123. Clarify the actual source(s) of this material, and explain why the total volume disposed (40 cubic yards) was so much less than that estimated (150-200 cubic yards).
11. Revise the third full paragraph on page 5 for consistency with Tables 2 and 4. According to those tables, the ten loads of Outfall 004 wastes were received over a period of three days (October 3-5, 2017).
12. Table 2 indicates that straw was placed on the landfill from October 16-19 and from November 7-15, 2017. Expand the fourth full paragraph on page 5 to explain why two phases of straw placement were needed, with such a relatively long delay between phases given the nature of the work activity.

Summary of 2017 Cell 3 Liner Repairs

13. The second paragraph in this section refers to Attachment E for details on repair of a controlled stress cut on the western slope of Cell 3. However, that attachment only provides Design Clarification Form #193 (which is essentially a work plan for the repair) and an illegible photograph with arrows. Because work activities may vary from those planned, the O&M memo should specify actions actually implemented, including liner weld testing results, inspection results, photographs, and other supporting information as appropriate. This same change should be made in the next two paragraphs with regard to repairs implemented pursuant to Problem Identification and Correction Reports (PICRs) #009 and #010.

Summary of 2017 Cell 3 Waste Placement

14. There are discrepancies between Figure 3, Figure 4, and Table 1 regarding the specific disposal locations of various waste types in the unit. For example, Figure 4 shows no steel placement within the grid locations B1 and B2, with grid location B1 instead occupied by the decontamination pad. However, Figure 3 and Table 1 do show bedded steel in these grid locations which, if accurate, calls into question how decontamination was conducted during placement of that steel. As another example, Table 4 (pages 24 and 25) of the memo indicates that contaminated concrete from Buildings 120 and 123 were placed in grid locations E8 and F8, but Figures 3 and 4 show no such placement. The figures also do not show the locations where test pit materials from Outfall 004 were disposed. Review the O&M memo and revise as needed to ensure comprehensive, consistent, and accurate waste placement details.
15. Expand this section to discuss remaining capacity in Cell 3, accounting for both waste and bedding/cover materials. The discussion should note how much space remains in Cell 3, with and without the expansion area (which has not yet been approved for waste disposal).
16. Correct the last paragraph in this section to refer to Table 2 for the project schedule (instead of Table 3), and expand Table 2 to specifically identify items that caused delays in the construction schedule. Repairs listed in the previous section appear to have been conducted concurrent with waste placement in other areas of existing Cell 3.

Table 2, Summary of 2017 Cell 3 Activities

17. Correct this table to delete the end date for the line item "Intrusive Work Began", or change the listed date to November 17, 2017 (the last date of any soil disturbance within Cell 3 during the 2017 field season).

Table 3, Summary of 2017 Cell 3 Operations Liner Repairs

18. Revise the first line item in this table to refer to PICR #008 regarding repair of a 9-foot by 13-foot area of liner damage in grid location B4. Reference to the associated memorandum dated June 14, 2017 can be included as a footnote to the table.